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ABSTRACT

Limited literature concerning computer technology exists in the field of counselor education despite the increasing use of technology as a method of instructional delivery. The use of computers to aid or mediate instruction is rapidly becoming commonplace in many counselor education programs, yet little is known about the pedagogical advantages of such instructional methods for student learning. The primary focus of this document is to relate thoughts about Computer Assisted Instruction (CAI) as a pedagogical approach for instruction, and also to illustrate the process by which the authors have developed one type of CAI project. The project consists of a CD-ROM for teaching counseling theories that lends itself to both instructional and research purposes. (Author)

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Development of a CD-ROM for Computer-Aided Instruction and Research

by

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Chapter Fourteen

Development of a CD-ROM for Computer-Aided Instruction and Research

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Limited literature concerning computer technology exists in the field of counselor education despite the increasing use of technology as a method of instructional delivery. The use of computers to aide or mediate instruction is rapidly becoming commonplace in many counselor education programs, yet little is known about the pedagogical advantages of such instructional methods for student learning. However, the on-line Journal of Technology in Counseling (JTC) (http://jtc.colstate.edu/) has published articles relevant to the use of Computer Aided Instruction (CAI) as a pedagogical approach in counselor education. For example, Hayes (1999) gives an overview of the history of computer aided instruction as related to counselor education and also calls for more research into the usefulness of multimedia instruction on student learning. Further, Baggerly (2002) directly addresses the issue of CAI and counselor education pedagogical principles indicating that, "A variety of technological applications can promote pedagogical principles of active learning in counselor education as long as form, i.e., technology, follows function, i.e., pedagogical principles of active learning." Casey (1999) also writes about the importance of "active" and "interactive" learning as pedagogy relevant to counselor education and illustrates the utility of CAI by giving examples of computer simulations for counseling students.

While an extensive review of CAI is not the focus of this chapter, readers wishing to gain a further historical context for the use of computer aided instruction in counselor education may want to read the first chapter of the original *Cybercounseling and Cyberlearning* (Bloom & Waltz, 2000). The section devoted to the historical relationship between counseling and Computer Aided Instruction (CAI) and the section relating to counselor education and supervision applications (Granello, 2000) will provide useful background. Readers are also encouraged to look at the 1984 special technology edition of the journal *Counselor Education and Supervision.* Also, due to the current state of the literature within counseling, counselor

educators wishing to learn more about CAI will have to look outside of our field. The general education and business education literatures are good places to find more information about CAI in publications such as the *Journal of Computer-Based Instruction.*

The primary focus of this chapter will be to relate thoughts about CAI as a pedagogical approach for instruction and also to illustrate the process by which the authors have developed one type of CAI project. The project consisted of a CD-ROM for teaching counseling theories that lends itself to both instructional and research purposes.

Technology as an Instructional Delivery System

Although the word "technology" is often used as a noun as though it were a "thing," technology is actually defined as "a method or process for handling a specific problem." Technology is not a tangible object but rather the process for solving a problem. In counselor education one of the primary directives is to solve the problem, "What is the best way to deliver instruction to students so that they may learn to be effective counselors?" Counselor educators have been using various methods and processes (technologies) for instruction throughout the history of counselor education. The ditto (photocopy), the chalkboard, the overhead projector, films, and audio and videotape are all instructional or information delivery systems that have been used in the past.

Today counselor educators have been given a new method for instructional and information delivery, namely the computer (and, perhaps more importantly to us, the software that runs on it). What makes the computer interesting is that it seems to offer unique features that the older information delivery systems did not offer. For example, computers are multimedia. They offer a wide array of audio, graphic, and text based information. Further, computers also allow media to be customized, disseminated, and interacted with in ways that other older information systems did not. Another important feature is that the computer is one of those rare tools that can be used to make other tools. Users can create materials on the computer such as web pages, programs, and text documents that can be shared and used by others. In a sense then the computer can both integrate information and disseminate that information in new ways that did not exist before.

Complicating things further, people have used the capacity of the computer to create its own applications to produce an ever-greater list of CAI information delivery modalities such as CD-ROMs, DVDs, specialized program applications, authoring applications, Web browsers, and streaming

media players. Commercial venders like WebCT and Blackboard provide software complete with a new array of methods for instruction such as chat rooms and threaded discussions.

Pedagogical Rationale for Computer Aided Instruction

Given that the growth of new instructional technologies has thus far significantly out-paced the ability of educators to research and evaluate their merits, the first question counselor educators should ask themselves is, "Do I have a pedagogical reason for wanting to use technology in my instruction?" This is a more complex question than it sounds. First, some faculty are pressured to "get with it" and to use technology for the sake of technology, not necessarily for the benefits it may bring to instruction. Faculty may dive headlong into using technology to please their department chairperson or dean who may think that technology (distance education in particular) is a panacea for their budget woes. Second and perhaps more importantly is the question, "Will my use of a specific technology enhance the students' learning?" There is a paucity of research on the actual pedagogy of counselor education and even less on the use of computer aided instruction.

Counselor educators should not confuse the development of standards for implementation of technology, such as the current Association for Counselor Education and Supervision standards (ACES, 1999a, 1999b), as empirical evidence that new technologies actually deliver the end goal, which is enhanced student performance. The ability to deliver information via a specific computer application, just because it is possible to do so, does not mean that it naturally follows such a delivery method is most desirable for student learning. For example, the use of PowerPoint to deliver lectures is now a common practice. However, frequently the materials that are projected using a computer are not any different than how text could have been presented using transparencies and overheads. In this case it can be argued that the use of technology does not really impact the students learning (unless features of PowerPoint are used that can not be duplicated via transparencies such as animations, video, or links to the Internet), but rather may only serve a purpose for the instructor, or worst of all may only be for the sake of using the equipment because it is available.

After pointing out the above caveats, why use CAI for delivering instructional materials to students? In response to the caveats, several reasons seem to make sense. First, it is only through interacting with computers and CAI can we improve our understanding of the computer as an instructional delivery system. Second, through such interaction we can

develop our skills as educators in using the tool of CAI. Lastly, we need to create more digital resources that can be used to further investigate the effects on student learning. What follows in this chapter is the process that was used to develop a CD-ROM for helping a student learn counseling theories. We undertook this process to learn more about the potential of computers as aides to learning, to improve our own skills with technology, and to create a learning resource for our students that could also be used to study the effect of CAI on their learning. Although the process of creating a CD-ROM is bound to be idiosyncratic to some extent, due to personal and environmental circumstances, it is hoped that providing some outline here will assist those endeavoring to explore CAI to think of some things they may not have, or even better, avoid some of the pitfalls associated with such a project.

Why a CD-ROM was a Good CAI Technology for this Project

Providing counselor education students with an opportunity to see videotapes of counselors who had different theoretical perspectives working with actual clients would be useful pedagogically because students would be exposed to appropriate modeling. Also we wanted students to interact with the material at their own pace outside formal class time, thus making learning more active and demonstrating a pedagogy that acknowledged students with differing learning styles.

It quickly became apparent such a project would be video intensive. We wanted to show at least two different clients being counseled and we wanted to show several different theoretical approaches. Four theories were decided upon: Rational Emotive, Gestalt, Brief Solution Focused, and Existential. These were chosen because they represented both diversity of theoretical approach and current widespread use in practice. Video taping two clients in four different counseling sessions, each showcasing a different theory, already meant creating eight videos. Remembering the good old 'Gloria' films, we decided it best to have the counselors comment on each session, so we added another eight videos to the project. In all, sixteen videos were created.

The high video demand of this CAI project led us to using compact disk technology as our instructional delivery system. While the content could have been delivered using an alternate technology such as streaming media player embedded on a web page, the amount of video associated with the project seemed to preclude this as a viable possibility for students. Most of our students were accessing the Internet using conventional phone lines through their university student accounts which unfortunately does

not transmit information fast enough to make streaming media practical for viewing large video files. All our students did have access to CD-ROM players in their computers or in labs that could play the video files. Further, CD's were portable, a familiar format to the students, and could store all of the information students needed to have for the CAI exercise. CDs were then chosen as the delivery technology for this CAI project because they eliminated many problems associated with delivering information via the Internet, such as software compatibility, server space, and bandwidth.

Planning and Producing Content

For the CD-ROM project at least five steps seemed warranted for developing content.

- *Creating a Project Proposal*

  As previously stated, we proposed the creation of sixteen videos plus the development of other content materials. Also mentioned were a proposed time line and an initial listing of necessary hardware and software. Finally the proposal listed project personnel, an estimate of their time, and an estimated budget.

- *Writing Support Text Files*

  In addition to video files we created support text files for the CD-ROM. The purpose of text files was to give students background or context in which to view each demonstration video. The text support files were kept brief because it is not efficient to have students read long text passages from a computer monitor. We created two types of files: one was a brief summary of each theoretical orientation consisting of key concepts and techniques associated with each theory, and the second was background information on each client's case. Students read these files before watching the video demonstration to contextualize the video material, both in terms of the client's specific case and the counselor's theoretical approach. Reading these files allowed students to know what to watch for and assisted in identifying specific techniques when viewing a counselor working from a particular orientation. Text files were created using Microsoft WordÆ and saved as hypertext markup language (HTML) files.

- *Finding Participants and Taping the Demonstration Video Files*

  Creating demonstration videos for each theory was more complicated than producing the supportive text files. Indeed,

making and editing the video was the most complicated step. First, we had to recruit two clients and a counselor who would demonstrate each of the four theoretical orientations. Each of the eight clients was paid a small stipend to participate. The clients were volunteers and the counselors were professionals from the Columbus, OH community known to practice in accordance with the theory they were asked to demonstrate. All counselors had university training in their particular theory and had attended professional education programs such as Gestalt or RET Institutes. The counselors were also provided with a text file of "key concepts" written about each of the four theories. Finally, counselors were instructed to not worry about providing a "perfect" example of their theory, but rather a realistic session of what their regular work with clients might look like. We did not want to script the counseling sessions or show "perfect" work samples that might seem unrealistically attainable for students, but rather real counseling session examples with both good and weak points.

Technically in filming the video demonstrations, we wanted to have several camera angles to add some variety to the videos. We employed three digital video cameras which taped in "digital eight" format. We set the cameras up on tripods in fixed locations, with one focused on the client, one focused on the counselor, and one focused on both. These cameras all taped the sessions simultaneously. We originally thought that we would use a special "conference table" type microphone, but actually found the microphones on the cameras to be just as good or better. We also suggest having each participant use a clip-on microphone to further improve audio quality.

Four theoretical approaches, not including counselor comments, with two clients from three angles yielded twenty-four digital tapes. The counselor comment videos were made by allowing each of the counselors to view the session we had just taped. Each counselor was instructed to stop the tape periodically and make a comment about his or her work with the client. These comments were filmed using one camera focused on the counselor.

- *Editing the Demonstration Videos*

  After getting the content onto digital videotapes, the next step was to transfer the digital eight taped material onto a computer hard drive so we could have video computer files with which

to work. The video cameras were plugged into a university lab Apple G4 computer with a "Firewire" connection. Firewire is a fast connection type method for moving large amounts of digital material and it worked rather well for our needs. We used the Apple "iMovie" program to download the video material from the cameras and to save material as "Quick-time" format video files. Further, we did not want to leave video files on the lab computer so we purchased a large external hard-drive (get the largest you can afford – ours was 80 gigabytes). All of the digital video files were then compressed and moved onto the external hard drive (again using firewire) making our material easily moveable from computer to computer. Once we had all the video material moved onto hard drive, the next step was to edit the three different angle videos for each demonstration session into one seamless video. Surprisingly, the editing of the video files, while very time consuming (allow one hour of editing time for each two or three minutes of end product video), was a lot more fun than expected. We used a program called "Final Cut Pro 3" to edit our files. We found that this was a very powerful program with many features that was relatively user friendly. There are many programs available that will allow you to edit digital video so find one that works best for you (see software tip below). Most of these editing programs work on a timeline principle, as did ours, that will allow you to "drag" and "drop" your video clips (extracted from your video files) into place. It is important to make sure that audio quality remains high, such that you do not omit any audio or overlap audio tracks when editing. Finally, after we edited our three video files into one final demonstration video, we recompressed the files and stored them on our external hard drive.

- *Creating an Interface*

  The last step of in the process of making the CAI project is to create an environment or interface in which you can structure how your students can access and work with the text, video, or any other types of files you have made (audio, image, etc.). This interface should be simple and straight forward. Today, many students are familiar with using Web browsers and using hyper-links to "move" or access information on a particular subject. We decided to make our interface as simple as possible and to make it like a Web page which we thought would be

familiar to our students and which they could view using a standard Web browser such as Microsoft Internet Explorer® or Netscape Navigator®.

The interface design should be "clean," without excessive text or irrelevant graphics that may distract or confuse your student learner. The interface is simply the template through which you want to deliver your material; it should not become a hindrance by being overly complicated to learn or intruding upon (via color, sound, or speed of presentation) the students' ability to focus on the instructional material. The interface should consist of a main page, which provides directions for navigation, and also a help text file. It is probably best to avoid complex navigation schemes and use of multiple layers of web pages.

There are many programs available for designing web pages (Microsoft Front-Page®, Netscape Composer®, Macromedia Dreamweaver®, Macromedia Flash®. Further, many of these programs now allow the user to work graphically and not have to know how to write complicated HTML. Although all of these programs have been designed to assist in developing Web pages, each has slightly different features and compatibility with different types of files. You will need to choose the program that will support the types of files and content that you want to deliver to your students.

We chose to work with Microsoft FrontPage® for our CAI project. The primary reason was our own skill level in working with this program, which we had used to create Web pages for Web sites. Also, this program was feature rich and used a similar menu of tools to those used in most Microsoft Office® applications. Design of Web pages is relatively simple using this program, which allows for graphical design that allows the user to make a Web page without knowing how to program in HTML. The final stage of the project is copying all of your files to the CD-ROM. You will need a CD-RW (read-write) drive in order to do this.

Tips and Reflections

- No software program is ideal.
  Unfortunately, there is no one perfect software program that can perform all of the "chores" for putting your CAI project together. You will need

to become familiar with several programs. We found that some of the more sophisticated software programs, such as Adobe PremierÆ, while feature rich, were also difficult to learn how to use. It is important to find programs that can perform the functions you require but do not ask you to invest hours learning how to use them.

- Most things are not "plug and play."
  Computers, no matter what platform used, can be vexing. Compatibility is a significant issue to consider when selecting hardware and software. This may sound silly, but make sure any external hardware (CD-RW or Hard Disk drives) will plug in to the ports you have available on your computers. Check, before you buy, that the software will work with the file types and extensions that you will be using for your project. For example, Microsoft FrontPageÆ does not work easily with Apple QuickTimeÆ files. Visit the hardware or software makers' web sites to find out about compatibility issues.

- Video files are very large.
  Video files get large quickly. This means that that you need storage space for them. Purchasing a large external hard drive is really helpful; you can keep all your files in one place, not fill up your computer, and the drive can be moved and plugged into different computers. Also, no matter how fast your computer, because these files are large, it takes time to download, edit, and save them. Allow appropriate blocks of time for your work sessions to avoid frustration.

- It costs money to make a CD-ROM.
  No matter what anyone tells you, it is not cheap to make a CD-ROM. You will need to have the right hardware, such as fast computers, external hard drives, digital video cameras, microphones, and CD-RW drives. You will also need software for editing video, creating text or other image content, and for designing your interface. Finally, your time, and the time of anyone else who assists, is worth money. So, know that equipment, software, and personnel are all budget considerations when considering a CAI project, like making a CD-ROM.

- A CAI Project is a Black Hole of Time. Beware! You can spend as much time as you have on a project like this. If you are like us and like to work with computers, you can find lots of reasons to work on a project like this instead of doing other more mundane faculty chores, like attending committee meetings. Taking on a project of this type requires a

considerable time commitment and you will need to weigh the benefits against the costs to you personally.

- Balance Quality with Practicality
  It is important to remember that the purpose of your CAI project is to make a useable learning resource for your students. When making video, you will not suddenly become imbued with the skills of Francis Ford Coppola, so sometimes an editing or lighting glitch is going to be OK. The question to ask your self is, "Will this technical problem adversely affect my students' ability to use and learn from this project?" If the answer is yes, then you can address the issue; if the answer is no, then let it be. If we as counselor educators want to get into the business of using video and computer technology as an instructional delivery system, we need to improve our skills in these areas and also realize that the quality of materials we produce ourselves will not be up to commercial standards.

- Collaboration is a necessary key for success.
  There is a lot of time and work in developing a good CAI project, so find others who are also interested in developing projects and spread the work around - sometimes many hands do make light work. Also, you may not need to become an expert in every part of the project - perhaps you can be the video person, the content producer, or interface designer. If you don't have to be in control of every facet of a project you also don't have to play all the roles. Take advantage of others' talents; as a counselor, bring your talents to bear at facilitating groups.

Using the CD-ROM for Pedagogical Research

One of the prime reasons for wanting to make a CD-ROM about counseling theories was to develop an instructional exercise for use by students that would lend itself to research. Specifically, by designing a CAI exercise for students, we could then study the effects of CAI on the students' learning. One research method would simply be to provide the CD-ROM to one group of students taking a theory course (treatment group) and have students in another theory course proceed without the CD-ROM (control group). Measurable outcomes could be scores on tests or quizzes concerning each theory, or observer ratings based on students' abilities to role-play appropriately with a standard client each of the theoretical orientations.

Conclusion

Counselor educators should not use a new technology for its own sake, but rather because it enhances our ability to instruct and our students ability to learn. Given the lack of research demonstrating the effectiveness of the use of CAI in counselor education, current applications of this technology should be considered experimental. Currently, faculty wishing to experiment with CAI may have to produce their own instructional materials, and choose a technology (CD-ROM, Internet streaming media) that they believe will enhance the efficacy of their students' learning. Contributions to the counselor research literature on the effects of CAI for counselor education students are sorely needed and it is hoped that the reader will consider using materials they may develop as a basis for research study and publication.

Computer technologies for aiding instruction are of course moving faster than our ability to make sense of them, or to fully grasp their implications for student learning. We just have a sense that they are mighty and that we must wrestle with our lack of understanding, so that we may harness their power for good purposes. So, it is not a matter of the technologically literate vs. the non-literate. All counselor educators are, of course, still trying to figure out just how to make the most of this new tool for information delivery and also to begin to study its impacts on student learning.

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